Identification of Roles

- 2007-2011; EWM Task Force (stakeholders) critical to project, including AVISTA Utilities, Celestine Duncan~Weed Mgmt. Services, Noxon-Cabinet Shoreline Coalition, MT Fish, Wildlife & Parks, MT Dept. of Agriculture, MT BASS Federation, Green Mountain Conservation District, Tri-State Water Quality Council, MSU Extension/Sanders Co., Sanders County Board of Co. Commissioners, Sanders Co. Weed District.
  - Geosystems Research Institute/Mississippi State Univ., US Army Corp. of Engineers, Cleanlakes, Inc. (critical partners)
- 2012; *Sanders County Aquatic Invasive Plants Task Force* relationship to Sanders Co (project sponsor) formalized through adoption of bylaws.

Lower Clark Fork River Setting

Two reservoirs = +11,000 surface acres

- 2008 Point sampling mapping (~4% of total surface area infested)
  - 247 acres Noxon Rapids Reservoir
  - 117 acres Cabinet Gorge Reservoir. Rate of spread ~9%/year.
- Littoral zone (<25') threatened area
  - Noxon Rapids Res = 25% of 1,942/7,940 acres
  - Cabinet Gorge Res = 35% or 1,121/3,200 acres

IPM: Barriers, Education, Check Stations, Education, **Chemical**

Run of the River Chemical Research ~ Phase I

- Variable water exchange characteristics of run-of-the-river systems. 24 Hr summer discharge pattern varies from nil to ~25,000 cfs. Complete turnover roughly 6 days. 2:30 a – 6:30 a extended half-life 15-fold to 33hr.

- Herbicide concentration & exposure time determined upon inert dye (rhodamine dissipation studies.
- Variable depth Litline injection system = precision placement, better contact, less herbicide & cost
- Triclopyr broadleaf (dicot), greater selectivity
- Endothall fast acting, non-selective contact herbicide: spectrum of plants controlled is rate & life-history dependant .

Run of the River Herbicide Research Phase I

- 2009 Two plots/four total; ~20 acres & inert tracer dye (water exchange measurements) Triclopyr @ 1.25-1.85 ppm & Endothall @ 1.45-2 ppm.
- 2010 Two plots; 28.2 acres (triclopyr); 15.8 acres (triclopyr/endothall).
- Triclopyr alone = 70% reduction (7WAT) 76% (52 WAT) Advantage: Greater selectivity (versus combination), less cost, Limitation; areas of low water exchange only.
- Combination: Triclopyr + endothall = 86% reduction (7WAT), 92% (52 WAT) slightly less selectivity, suited for areas of greater turnover
- Native species statistically unaffected

Environmental Assessments Completed

Research EA. Up to 40 acres. Triclopyr, endothall, 2,4 D Amine May 28, 2009

Research & Implementation EA May 7, 2010
Authorize up to 200 acres/year over 10 yr period.

Public Awareness Critical

Aquatic Herbicide Rates

from Washington Ecology

- Lower concentrations 1.5 ppm
- High concentrations 2-3 ppm
- Most aquatic plants including curly leaf pondweed are monocots, Eurasian Watermilfoil is a dicot.